Thermodynamic Properties of Gas Condensates and Their Fractions

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On the basis of our experimental data and the most reliable published data ,methods were developed to calculate thermodynamic properties of gas condensates and their fractions in liquid and gaseous phases, including the phase transitions curves. The properties are density, isobaric heat capacity, saturation pressure, enthalpy, and entropy. Data relevant to the properties of light oil fractions were used to test the methods. Comparisons of experimental data and calculated values of properties were made with well-known generalized cubic equations of state (Redlich-Kwong and Soave, Peng-Robinson) as well as the generalized equation of state of Lee and Kesler. It was shown that the equation of Lee and Kesler is reliable for prediction of caloric properties in a wide range of state conditions including the vicinity of the critical point.

A method is discussed for modeling fractions with subfractions and pseudocomponents by using the data for the true boiling temperature with application to calculations of phase equilibria. Recommendations on the application of the proposed methods are discussed.